

A Finite-Element Analysis Of Bipolar Ionized Field

Abdel-Salam, M. Al-Hamouz, Z.;Dept. of Electr. Eng., King Fahd Univ. of Pet.Miner.,
Dhahran;

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King Fahd University of Petroleum & Minerals

<http://www.kfupm.edu.sa>

Summary

This paper describes a new iterative method for the analysis of the bipolar ionized field in HVDC transmission lines without resorting to Deutsch's assumption. The finite-element technique (FET) is used to solve Poisson's equation where the constancy of the conductors' surface field at the corona inception value is directly implemented in the finite-element formulation. The proposed method has been tested on laboratory and full-scale models. The calculated V-I characteristics agreed well with those calculated and measured previously. The dependence of the corona current as well as its monopolar and bipolar components on the conductor height is discussed. The simplicity in computer programming in addition to the low number of iterations required to achieve convergence characterize the proposed method of analysis

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